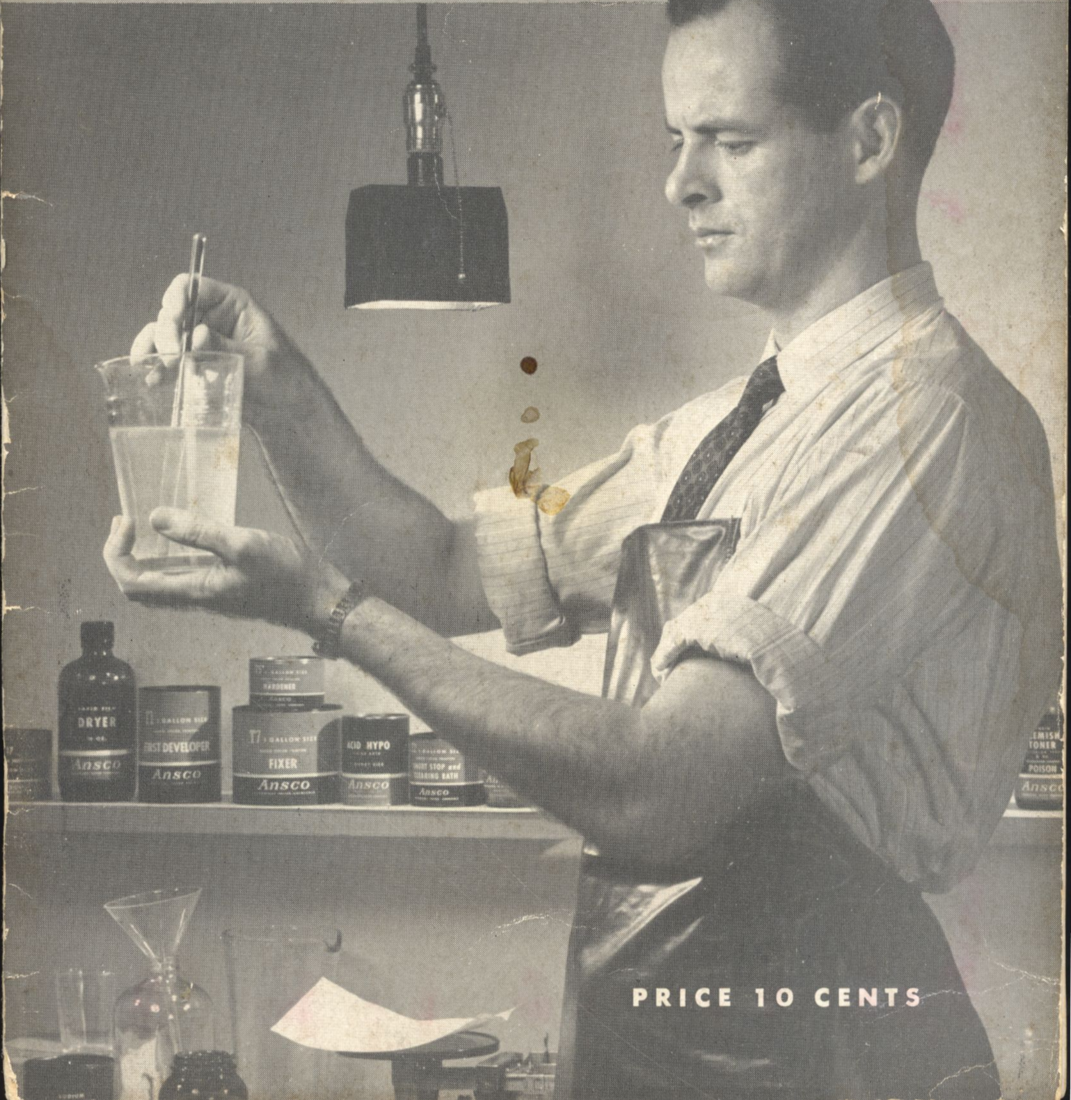
ANSCO FORMULAS

FOR BLACK AND WHITE PHOTOGRAPHY



PRICE 10 CENTS

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(Gallon, quart and fluid ounce quantities listed are expressed in U. S. liquid measure.)

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CHEMISTRY FOR THE PHOTOGRAPHER

PHOTOGRAPHERS everywhere realize the importance which chemistry holds in photographic work, but often consider the subject too formidable and involved for application to their own work. This discussion has been prepared to help dispel that fear, and to show that theoretical knowledge is unimportant if the photographer knows in a practical way, what is in a developing or fixing solution, why it is there and how it accomplishes its own particular job.

The general structure of photographic cellulose nitrate and acetate film, its components of nitrocellulose (acetyl cellulose) base, emulsion coating of gelatin which contains suspended particles of light-sensitive silver salt, and auxiliary layers for such purposes as prevention of halation, are common knowledge among photographers. The chemistry involved in this branch of the science is held under precise control by the manufacturer and causes the photographer little concern. Photographic chemistry begins to affect the photographer more directly in the developing and fixing operations carried out with film and paper. It is therefore well worth while to consider first the composition and function of the developing solution to see what it contains and what it does to effect development.

When a photographic emulsion is exposed to light, the silver salt (silver bromide, chloride or iodide) which the light reaches, undergoes a definite though invisible change to form what is known as the latent image. It is not yet definitely known just how this change takes place, but it is believed the exposed parts of the emulsion gain a certain "activation" that makes them susceptible to the reducing action of a developer. When placed in a developing solution the exposed, "activated" particles of silver salt are reduced chemically to black metallic silver, leaving the unexposed particles of silver salt unchanged. Reduction in this sense does not have the meaning commonly thought of in the photographic field, namely, the lessening of density in a film negative. This *chemical* reduction is a conversion of the silver salt to free silver and for the reaction one or more *reducing agents*—which photographers call "developers" are necessary.

THE DEVELOPER'S BASIC COMPONENT

There are many chemicals which are reducing agents, but most of them are too powerful to be used for developing because they reduce all the silver salt in the emulsion without regard to the latent image which exposure in the camera has produced. Therefore a reducing agent must be selected which is satisfactory as a developer and which confines its action to the exposed particles of silver salt, leaving the remainder unaffected. Of the reducing agents that are satisfactory for photographic use, metol, hydroquinone and pyro are most commonly used, and there are in addition other developing agents such as glycin, amidol and rodinal frequently employed. There are also several developing agents on the market under different names from metol, but which are basically the same chemical — monomethyl-para-amino-phenol-sulfate.

As has been indicated, the chemical action of these developing agents is fudamentally the same. The photographic effect, however, depends to a large extent on the particular developing agent and the way in which it is used. Thus many developers contain a combination of developing agents, and one formula may have, for example, a high percentage of hydroquinone to produce brilliant photographic images while another formula may use a larger ratio of metol to produce softer results.

It is obvious therefore, that great care should be taken in the preparation of developing solutions, for a slight error in the type or amount of the developing agents (or the other constituents too, for that matter) may have a serious effect on the behavior of the developer. Most successful photographers have found that it is far wiser to use the formulas recommended by the manufacturer and to make sure solutions are carefully and accurately mixed, than to spend time on individual experimenting or research. The use of recommended formulas is undoubtedly one of the most important helps to getting good results in film development.

OTHER INGREDIENTS OF THE DEVELOPING SOLUTION

The function and importance of the developing agent in the developer have both been mentioned—but there are three other components which also play an important role in any developing solution. The first of these is the alkali—which is ordinarily essential for development. Most of the developing agents in use today are neutral or slightly acid in their normal state, and in this condition give little or no developing action. However, when an alkaline salt like sodium carbonate is introduced into the solution containing the developing agent, a very interesting change takes place. The developing agent forms what is called an alkaline salt which in a photographic sense is a more active material, and it is this alkaline salt of the developing agent that actually reduces the exposed grains of silver salt to metallic silver. The alkali has a secondary effect in the developing solution which is also important. It helps the gelatin emulsion to swell and thus facilitates the penetration of the developing solution throughout the network layer of the emulsion.

It is obvious that the alkali is a really important component of the developing solution and it is likewise evident that care must be exercised in using the right kind and correct amount of alkali. Sodium carbonate is normally recommended though potassium carbonate is sometimes used in its place. The caustic alkalis, sodium hydroxide and potassium hydroxide, should not be substituted unless definitely specified as they are much stronger and can easily cause fog. Normally they are used only in special-purpose developers giving high contrast. Borax and similar alkalis which are less energetic are often specified for fine-grain development in which grain size must be controlled by softer development. Another alkali used for photographic work is sodium metaborate which is helpful in reducing blister formation where it is difficult to control the temperature of processing solutions during hot weather.

The amount of alkali should of course be weighed accurately to the amount specified, as too much may cause fog in developed negatives; too little may result in slow, soft development. It is important to remember when using carbonate, that the potassium salt is generally available only in the anhydrous form, while the more generally used sodium salt can be obtained as (1) the anhydrous salt containing about 2% water, (2) the monohydrated salt containing about 15% water, or (3) in crystal form containing about 63% water. The anhydrous and crystalline forms are both unstable at ordinary conditions of temperature and humidity, and must be kept in tightly sealed containers and used with great care to prevent considerable absorption of water from the atmosphere by the anhydrous salt, or loss of water by the crystalline form. The monohydrated form of sodium carbonate is stable and therefore preferred by most photographers for accurate preparation of developing solutions.

THE IMPORTANCE OF A PRESERVATIVE

It is a characteristic of many photographic reducing agents in alkaline solutions to combine freely and easily with oxygen. Because of this affinity for oxygen, alkaline solutions of the developing agents spoil very quickly when exposed to air. To increase their useful life, to allow the developing agent to do its work on the exposed silver halide as desired, and to prevent the occurrence of stains, a preservative must be added to the developing solution.

Sodium sulfite is ordinarily used as the preservative, though in developers prepared for stock in two solutions, preservatives which are slightly acid in solution such as sodium bisulfite and potassium metabisulfite are preferred. Because developing agents keep better in acid solution than in one which is alkaline, it is common practice to use one of these acid sulfites as the preservative in the developer part of the stock solution. In single-solution developers, sodium bisulfite is never used alone as a preservative since it neutralizes some of the alkali in the solution and would result in softer development. One other interesting point about preservatives is that in some cases the preservative performs a secondary function in the developer. In some fine-grain developers, for instance, a large amount of sodium sulfite is used to aid in keeping grain size at a minimum.

The fourth and final important component of the typical developing solution is the restrainer, potassium bromide. This necessary constituent of the developing solution acts as a "brake" on the chemical reaction of development and keeps the operation under control. The action of the restrainer is such that an increase in the concentration of potassium bromide in the developer tends to slow down or "restrain" the development of the photographic image. The concentration of potassium bromide in the solution is obviously important, for too much may retard development excessively and indicate an apparent loss of speed while too little may permit development of fog.

DEVELOPER EXHAUSTION

The chemical reaction of development results in a depletion of certain constituents of the developing solution so that with continued use the developer becomes less efficient. This "exhaustion" of the developer is characterized by a loss in effective speed and gradation of the photographic emulsion (of importance in both film and paper development) and by a change in tone of the developed image (of special importance in making prints). In consequence of this condition, it is standard practice to use fresh developing solution whenever possible, as it is good insurance in obtaining uniformly optimum results with photographic films and papers.

There are, however, occasions when a rather large quantity of developer must be put in use, as in the tank development of films, and in such circumstances it becomes desirable, for reasons of economy, to prolong the usefulness of the developer by the addition of a "replenisher" solution which replaces solution carried away on developed films and helps restore the balance of active ingredients in the solution. For replenishers for Ansco formulas commonly used in tank development, see the formulas appended to Ansco 17, 17M, 47 and 48M.

By the occasional addition of such replenishers to maintain a constant volume of solution in the developing tank, the useful life of the developer can be prolonged three to four times without seriously degrading the quality of developed negatives. If large amounts of replenisher are to be added at any one time, the activity of the solution may be so increased that developing time will have to be shortened excessively, unless the replenisher is diluted somewhat with water.

Frequent requests are made for information on the exhaustion characteristics of a developer so that the user may have some idea of the amount of film or paper that may be safely processed. The accuracy of information given on this point depends largely on the three following factors which should be considered when interpreting data on exhaustion characteristics.

1. The rate of exhaustion is greatly influenced by the type of negatives or prints. When average density is high, exhaustion will be faster.

When average density is low, exhaustion will occur more slowly.
2. The useful life of a developer is shortened by oxidation caused by contact with air. Exhaustion characteristics will, therefore, depend greatly on the age and manner in which the solution is used.
3. The degree of permissible exhaustion of paper developers is also dependent on the acceptable tolerance in variation of image tone of prints. Exhaustion figures cited below are based on what are normally considered acceptable prints, and may require modification if unusually critical standards of uniformity of image tone are established.

With appropriate regard given to the factors mentioned above, the following figures on developer exhaustion may be applied in practice. Ansco film developers 17, 17M, 47 and 48M can be safely used without replenishment for the development of 24 rolls of 120 (B2) size (or an equivalent amount of other size film) per gallon of developer if compensation in developing time is made as the solution is used. On the basis of a gallon of developing solution the increase in developing time amounts to approximately 10% for every four rolls of film processed—or more simply, 10% increase per roll per quart of developer. When used with their respective replenishers at the rate of ½ to ¾ ounce or more of replenisher per roll of film, these developers may be used for approximately 200 120 (B2) rolls per gallon of original developer without necessitating an increase in the original time of development. When adding replenisher, maintain original volume of developer discarding, if necessary, some used developer.

Ansco paper developers 103, 125 and 135 may be used satisfactorily without replenishment for the development of from 100 to 125 8 x 10-inch prints per gallon of working strength developer. This quantity assumes a change of tone within acceptable limits and a slight and progressive increase in exposure and developing time in order to maintain constant print quality throughout the life of the solution.

THE IMPORTANCE OF A SHORT STOP

As negatives or prints are removed from the developing solution, they carry with them considerable amounts of alkali and other chemicals which can contaminate the fixing bath and interfere with its action. Used-up developer carried along with negatives and prints can also cause troublesome stains if some method is not used to stop development instantly and completely. The best and most reliable way of doing this is the well-known short-stop bath of dilute acetic acid which neutralizes any alkali remaining on negatives or prints and prevents contamination of the fixing solution. Yet it is surprising how many photographers still try to get along without this intermediate bath between development and fixation. It is true that an acid fixing bath will give satisfactory results without the use of a preliminary short-stop bath, but its useful life is severely limited when a short-stop is not used.

Photographers frequently ask why acetic acid is used for the short-stop bath and fixing bath instead of other common acids like hydrochloric or sulfuric. The answer lies in the fact that a relatively large amount of acid must be available but the solution must not be too strongly acid. Consequently a compound is used which is weak in acidity but which has available a high reserve of acid to neutralize alkali. A correspondingly larger amount of the weak acetic acid may therefore be used than could be used of a strong acid.

COMPOSITION AND FUNCTION OF THE FIXING BATH

The procedure of fixation is relatively simple but it should be carried out with considerable care as it can be the source of much trouble when improperly handled. The photographic film negative upon removal from the developing solution is still sensitive to light, as it contains undeveloped silver salt in the shadow portions of the image. To make the negative image permanent by removing this undeveloped silver salt, as well as to make it clear and transparent for printing, the action of the familiar fixing bath must be employed. The principal constituent of the fixing solution is sodium thiosulfate, more commonly known as "hypo" (from its older name of sodium hyposulfite), for in solution this useful chemical has the property of dissolving light-sensitive silver salts. The method by which the silver salt is removed is generally considered as, first, a conversion to a soluble double salt by the hypo, and second, the washing out of this soluble salt with water.

The conventional fixing solution generally contains other chemicals in addition to the hypo. Acetic acid is often included to aid in regulating the acidity of the fixing solution and to prevent stains. However, a hypo solution containing much acid is apt to precipitate sulfur, so another chemical, sodium sulfite, is added to prevent this unwanted reaction.

An additional component of the usual fixing bath is the hardening agent which prevents frilling and softening of the gelatin emulsion. White potassium alum (potassium aluminum sulfate) is usually employed for this purpose though some photographers prefer potassium chrome alum used with a small amount of sulfuric acid. Care must be used with chrome alum as the hardener, however, as it rapidly loses its strength and is actually only effective when a fresh solution is used.

Fixing baths will seldom if ever give trouble when properly prepared from pure chemicals. If a bath turns milky after preparation, it indicates that sulfur is precipitating because of too much or too strong an acid, too little sulfite, too high a temperature of the solution, or improper mixing. A milky appearance of the bath during use is due to the presence of excess alkali and indicates that the bath should be replaced. It is important not to overwork the fixing bath, because a nearly exhausted fixing solution will not completely remove the silver salts, and prints or negatives may turn yellow or stain on aging. A gallon of standard-strength fixing bath should fix 100 to 120 8 x 10″ double-weight prints or their equivalent. About 110 rolls of size 120 (B2) film (or equivalent) may be fixed in one gallon of standard-strength fixing bath if the films have previously been rinsed in a short-stop bath or plain water. When the bath froths or foams, it should be replaced. Many photographers have found a convenient, dependable and economical method of insuring complete fixation lies in the use of two fixing solutions. Fixing is carried out first in the more used of the two baths and finally in the fresher solution. When the older bath becomes exhausted, the partly used solution takes its place and a fresh fixing bath is prepared for the second solution.

SUGGESTIONS FOR TROUBLE-FREE MIXING

The first and perhaps most important point to follow in the preparation of solutions is that of using chemicals which are "photographically pure." Cheap commercial grades of every chemical used in photographic processes can be obtained, but many of them contain impurities which are detrimental to quality results. Chemicals which are marked "C. P." (Chemically Pure) and those which are marketed for photographic purposes by reliable manufacturers are always safe to use, and can be depended upon. Chemicals marked U.S.P. may be suitable if the amount of impurity present is known to be insignificant. This can be determined by looking up the U.S.P. standards for the chemical in question by consulting the edition of the United States Pharmacopoeia, tenth edition (1925) or eleventh edition (1935) as indicated by the number X or XI which follows the U.S.P. on the chemical container label.

The second most important rule for trouble-free solutions is perhaps that of mixing all components of a solution in the order listed in the formula. This is extremely important and lack of attention to this point can easily result in the formation of precipitates which will not dissolve in the solution. A worth-while corollary to this rule is to wait until each chemical is thoroughly dissolved before adding the next component of the solution. In most single-solution developers, the preservative sodium sulfite is usually added immediately after the developing agent but before the hydroquinone if this chemical is used. When two developing agents such as metol and hydroquinone are used, the addition is generally made in the order metol, sulfite, hydroquinone. However, with developing agents like glycin, the sulfite and carbonate are dissolved first, as glycin dissolves with greater difficulty otherwise.

A third important rule for any photographer is to use the purest water obtainable. Innumerable troubles in developing and fixing have been traced to impurities present in the water. Many photographers find it a wise decision to use distilled water for all stock solutions, adding tap water for dilution.

The time required for the preparation of processing solutions can be reduced materially by the use of hot water (about 125 F) as most chemicals dissolve more rapidly in hot than in cold water. A convenient method of preparing one quart of developer, for instance, is to start with about 24-28 ounces of hot water (125 F) and after the addition of all chemicals, to add sufficient cold water to bring the total volume up to 32 ounces.

Another point well worth remembering is that of weighing and measuring all quantities as closely as possible. Particular care should be taken to avoid errors in small quantities, as a ten-grain error is obviously a very serious one on a fifty-grain quantity, while on a half-pound quantity it might not have harmful effects.

Finally and no less important for the order in which it is mentioned, is the matter of temperature. The need for uniform regulation of temperature cannot be overemphasized. While it has in the past been accepted practice to develop film at 65 F and paper at 70 F, practical considerations have resulted in the recommendation of 68 F for both film and paper development. Accordingly, all developing times listed in this book have been revised to conform with this standard 68 F.

COMPENSATION OF NON-STANDARD TEMPERATURES

While best results are obtained when film development is carried out at 68 F, there are, of course, certain occasions when surrounding conditions are such that it is impossible to maintain solutions at this temperature. In instances when the temperature is not higher than 75 F or lower than 60 F., development can be carried out with care if the developing time is modified to keep the contrast of the developed film negative within a desired range. The following table of Time-Temperature Coefficients indicates the percentage correction in developing time for a number of popular Ansco formulas. If, for example, it were necessary to use Ansco 17 at 75 F, with a film normally requiring 12 minutes development at 68 F, the developing time would be reduced 35% to approximately 8 minutes in order to keep contrast within the desired range. Of course, care must be taken in handling wet photographic film at the higher temperatures, as the gelatin emulsion is then more susceptible to scratches and other physical damage.

TIME-TEMPERATURE COEFFICIENTS

Developer	*Percentage Change from Developing Time Used at 68 F*	
	60 F	*75 F*
Ansco 17	+65%	—35%
Ansco 17M	+65%	—35%
Ansco 20	+85%	—35%
Ansco 30	+85%	—35%
Ansco 45	+50%	—30%
Ansco 47	+65%	—35%
Ansco 48M	+65%	—35%
Ansco 64	+75%	—25%

When development is necessary at temperatures above 75 F, the use of a chemical such as sodium sulfate, which acts as a "swelling suppressor," is advisable. For development at 80 F, 100 to 150 grams (3½ to 5 ounces) of sodium sulfate crystals* should be added to each liter (quart) of *developer* and *short-stop* so that protection against excessive swelling will be afforded until films have been hardened in the fixing bath. Developing time at 80 F with the proper amount of sodium sulfate added will be approximately 30% less than the normal developing time at 68 F. If temperature falls below that for which sodium sulfate addition is made, developing time may have to be lengthened 30 to 50% to compensate for loss in developing action.

Due to the rapid oxidation of pyro at high temperatures Ansco 45 should not be used at temperatures above 75 F.

Another method of minimizing the chance of physicial damage caused by processing at high temperatures is the use of a hardening short-stop bath, such as Ansco 216, directly after development. In summation, these methods of high-temperature processing should not be considered as preferred developing technique but merely as the best expedient when processing solutions cannot be maintained at 68 F.

AGITATION

Developing times listed with formulas shown on later pages of this booklet, as well as the time-temperature compensation methods previously described, are based on effective agitation of the film in the developing solution. Effective agitation can be considered to be any method which provides a continual flow of solution across the surface of the film, but for practical considerations an *intermittent* form of agitation can be employed which will adequately remove development by-products and supply fresh developing solution to the film emulsion. Such a method requires actual movement of the film in the developer, or developer over the film for 5 seconds out of every minute, and can be achieved by rocking the tray in tray development, or by agitation of the film in the solution when tank development is employed. The important point is that a standardized method of getting effective agitation should be established if uniformly excellent results are to be obtained in film development.

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* If anhydrous sodium sulfate is employed use ½ the amount specified.

ANSCO 70

HYDROQUINONE CAUSTIC DEVELOPER

This developer is recommended for Process film used in reproduction work.

Solution 1

	Metric	*Avoirdupois*	
Hot Water (125 F or 52 C)	750 cc.	24 ounces	3 quarts
Ansco Hydroquinone	25 grams	¾ oz. 40 gr.	3¼ oz. 50 gr.
Potassium Metabisulfite	25 grams	¾ oz. 40 gr.	3¼ oz. 50 gr.
Ansco Potassium Bromide	25 grams	¾ oz. 40 gr.	3¼ oz. 50 gr.
Cold Water	1 liter	32 ounces	1 gallon

Solution 2

Cold Water	1 liter	32 ounces	1 gallon
*Sodium Hydroxide (Caustic Soda Flakes)	36 grams	1 oz. 90 gr.	4¾ oz. 30 gr.

Mix equal parts of Solutions 1 and 2 immediately before use.
Develop films not longer than 3 minutes at 68 F (20 C).

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* May be substituted by:

Potassium Hydroxide	50 grams	1½ oz. 75 gr.	6¾ ounces

ANSCO 72

GLYCIN DEVELOPER

This clean-working formula is recommended for use with commercial films in reproduction work when a comparatively low maximum density is desired. It is also suitable for development of roll, pack and sheet film providing a long scale of tonal gradation.

Stock Solution

	Metric	*Avoirdupois*	
Hot Water (125 F or 52 C)	800 cc.	25 ounces	3 quarts
Ansco Sodium Sulfite, anhydrous	125 grams	4¼ ounces	1 lb. 1 oz.
Potassium Carbonate	250 grams	8½ ounces	2 lb. 2 oz.
Ansco Glycin	50 grams	1½ oz. 75 gr.	6¾ ounces
Water to make	1 liter	32 ounces	1 gallon

TANK DEVELOPMENT: Take one part stock solution, fifteen parts water and develop 20 to 25 minutes at 68 F (20 C). TRAY DEVELOPMENT: Take one part stock solution, four parts water and develop 5 to 10 minutes at 68 F (20 C).

ANSCO 73

HIGH CONTRAST M-H TRAY DEVELOPER

This formula is recommended for development of Process, Commercial and similar films when extremely high contrast is desired. See footnote under Ansco 90 on page 18 for formula.

ANSCO 79

PARAFORMALDEHYDE DEVELOPER

This is a standard formula recommended for development of Reprolith and Reprolith Ortho Films. Ansco 79 may be obtained in packaged form by ordering "PARALITH DEVELOPER."

	Metric	*Avoirdupois*
Water (Not over 90 F or 32 C)	2000 cc.	64 ounces
Ansco Sodium Sulfite, anhydrous	120 grams	4 ounces
Paraformaldehyde	30 grams	1 ounce
Potassium Metabisulfite	10.5 grams	¼ oz. 45 gr.
Boric Acid Crystals	30 grams	1 ounce
Ansco Hydroquinone	90 grams	3 ounces
Ansco Potassium Bromide	6 grams	88 grains
Water to make	4 liters	1 gallon

Dissolve chemicals in the order given and use solution full strength. Normal developing time 2 to 3 minutes at 68 to 70 F (20 to 21 C). For Reprolith Orthochromatic, develop 1½ to 3 minutes at same temperature.

ANSCO 81

REPROLITH DEVELOPER

This formula may be obtained in packaged form by specifying Reprolith Developer. Formula 81 provides a single-solution developer of excellent keeping quality for the development of Reprolith Film.

	Metric	*Avoirdupois*	
Hot Water (125 F or 52 C)	750 cc.	24 ounces	3 quarts
Ansco Hydroquinone	35 grams	1 oz. 75 gr.	4¾ ounces
Ansco Sodium Sulfite, anhydrous	55 grams	1¾ oz. 40 gr.	7¼ oz. 50 gr.
Ansco Sodium Carbonate, monohydrated	80 grams	2½ oz. 80 gr.	10¾ ounces
Citric Acid	5.5 grams	80 grains	½ oz. 100 gr.
Ansco Potassium Bromide	10 grams	¼ oz. 35 gr.	1¼ oz. 40 gr.
Water to make	1 liter	32 ounces	1 gallon

Do not dilute for use. Normal developing time not longer than 3 minutes at 68 F (20 C).

ANSCO 90

HIGH CONTRAST M-H TRAY DEVELOPER

This developer has been particularly designed for use with Commercial and Process films* to produce negatives of brilliant contrast.

	Metric		*Avoirdupois*			
Hot Water (125 F or 52 C)	750	cc.	24	ounces	3	quarts
Ansco Metol	5	grams	72	grains	½	oz. 70 gr.
Ansco Sodium Sulfite, anhydrous	40	grams	1¼	oz. 40 gr.	5¼	oz. 50 gr.
Ansco Hydroquinone	6	grams	88	grains	¾	oz. 20 gr.
Ansco Sodium Carbonate, monohydrated	40	grams	1¼	oz. 40 gr.	5¼	oz. 50 gr.
Ansco Potassium Bromide	3	grams	44	grains	¼	oz. 65 gr.
Water to make	1	liter	32	ounces	1	gallon

Do not dilute for use.

Normal developing time, 4 to 6 minutes at 68 F (20 C).

* For results of higher contrast, this developer may be adapted to give Ansco 73 formula by the addition of three grams of potassium bromide per liter of developer (45 grains per 32 oz.), with developing time of 2 to 3 minutes at 68 F (20 C).

ANSCO 103

PAPER DEVELOPER

This formula is recommended as a developer for Convira and Speedex papers when cold, blue-black tones are desired. It may be had in packaged form by ordering Ansco 103 Developer.

Stock Solution

	Metric		*Avoirdupois*			
Hot Water (125 F or 52 C)	750	cc.	24	ounces	3	quarts
Ansco Metol	3.5	grams	51	grains	¼	oz. 95 gr.
Ansco Sodium Sulfite, anhydrous	45	grams	1½	ounces	6	ounces
Ansco Hydroquinone	11.5	grams	¼	oz. 50 gr.	1¼	oz. 90 gr.
Ansco Sodium Carbonate, monohydrated	78	grams	2½	oz. 45 gr.	10½	ounces
Ansco Potassium Bromide	1.2	grams	18	grains	70	grains
Water to make	1	liter	32	ounces	1	gallon

PAPER DEVELOPMENT: Dilute 1 part stock solution with 2 parts water. For Speedex and Convira normal developing time is 45 seconds. Other contact papers may require 1 to 1½ minutes.

ANSCO 110

DIRECT BROWN-BLACK PAPER DEVELOPER

Beautiful warm tones may be obtained with this developer on both contact and projection papers.

Stock Solution

	Metric		*Avoirdupois*			
Hot Water (125 F or 52 C)	750	cc.	24	ounces	3	quarts
Ansco Hydroquinone	22.5	grams	¾	ounce	3	ounces
Ansco Sodium Sulfite, anhydrous	57	grams	1¾	oz. 65 gr.	7½	ounces
Ansco Sodium Carbonate, monohydrated	75	grams	2½	ounces	10	ounces
Ansco Potassium Bromide	2.75	grams	40	grains	¼	oz. 50 gr.
Water to make	1	liter	32	ounces	1	gallon

For use dilute 1 part stock solution with 5 parts water.

Give prints 3 to 4 times normal exposure and develop 5 to 7 minutes at 68 F (20 C).

ANSCO 113

AMIDOL PAPER DEVELOPER

This formula is intended for tray development only and must be mixed fresh each time. It is recommended only for small lots of prints.

	Metric		*Avoirdupois*	
Ansco Amidol	6.6	grams	96	grains
Ansco Sodium Sulfite, anhydrous	44	grams	1½	ounces
Ansco Potassium Bromide	.55	gram	8	grains
Water to make	1	liter	32	ounces

Do not dilute for use. If hot water is used for dissolving chemicals, the sodium sulfite and potassium bromide should be dissolved first and the amidol added only after the solution has cooled.

For development of Cykora and similar papers use twice the amount of potassium bromide specified above.

Develop 1 to 2 minutes at 68 F (20 C).

ANSCO 115

GLYCIN-HYDROQUINONE DEVELOPER

This is a warm-tone developer suitable for Cykon, Cykora, Indiatone, Brovira, and similar papers.

Stock Solution

	Metric	*Avoirdupois*	
Hot Water (125 F or 52 C)	750 cc.	24 ounces	3 quarts
Ansco Sodium Sulfite, anhydrous	90 grams	3 ounces	12 ounces
Ansco Sodium Carbonate, monohydrated	150 grams	5 ounces	1 lb. 4 oz.
Ansco Glycin	30 grams	1 ounce	4 ounces
Ansco Hydroquinone	9.5 grams	¼ oz. 30 gr.	1¼ oz. 5 gr.
Ansco Potassium Bromide	4 grams	59 grains	½ oz. 15 gr.
Water to make	1 liter	32 ounces	1 gallon

For warm tones, dilute 1 part stock solution with 3 parts water and develop prints 2½ to 3 minutes at 68 F (20 C).

For very warm tones and more open shadows, especially with Cykora, dilute 1 part stock solution with 6 parts water, giving prints 3 to 4 times normal exposure and 2½ to 5 minutes development. Because of dilution of the developer, solution will exhaust more rapidly and will require more frequent replacement.

ANSCO 120

SOFT-WORKING PAPER DEVELOPER

This is a soft-working developer, primarily intended for portrait work where soft gradation is required.

Stock Solution

	Metric	*Avoirdupois*	
Hot Water (125 F or 52 C)	750 cc.	24 ounces	3 quarts
Ansco Metol	12.3 grams	¼ oz. 70 gr.	1½ oz. 60 gr.
Ansco Sodium Sulfite, anhydrous	36 grams	1 oz. 88 gr.	4¾ ounces
Ansco Sodium Carbonate, monohydrated	36 grams	1 oz. 88 gr.	4¾ ounces
Ansco Potassium Bromide	1.8 grams	26 grains	¼ ounce
Water to make	1 liter	32 ounces	1 gallon

For use, dilute 1 part stock solution with 2 parts water.

Normal developing time, 1½ to 3 minutes at 68 F (20 C).

TWO-TRAY PRINT DEVELOPMENT

While the majority of photographic prints can be prepared most conveniently by development in a single solution, some occasions are often met in which the critical nature of the subject requires a degree of control over contrast that is not normally available. In such instances the two-tray, print developing procedure can be employed to good advantage, for it permits a nicety of control over print gradation that cannot be obtained by usual variations of exposure and developing time.

The two-tray procedure involves the use of two separate developing solutions, usually a soft-working formula, such as Ansco 120, and a brilliant-working developer like Ansco 130—though some workers prefer the combination of Ansco 120 and 125. Development is begun in one solution and completed in the other, the first developer used having the greater effect. This procedure is particularly helpful in producing full-scale prints which exhibit well-modulated gradation in both highlight and shadow.

ANSCO 125

PAPER AND FILM DEVELOPER

This formula is recommended for development of Cykon, Cykora, Brovira, Convira, Indiatone and similar papers. It can also be used for development of roll, pack and sheet film when brilliant negatives are desired. It may be obtained in packaged form by ordering Ansco 125 Developer.

Stock Solution

	Metric	*Avoirdupois*	
Hot Water (125 F or 52 C)	750 cc.	24 ounces	3 quarts
Ansco Metol	3 grams	44 grains	¼ oz. 65 gr.
Ansco Sodium Sulfite, anhydrous	44 grams	1½ ounces	6 ounces
Ansco Hydroquinone	12 grams	¼ oz. 65 gr.	1½ oz. 45 gr.
Ansco Sodium Carbonate, monohydrated	65 grams	2 oz. 75 gr.	8¾ ounces
Ansco Potassium Bromide	2 grams	29 grains	¼ oz. 8 gr.
Water to make	1 liter	32 ounces	1 gallon

PAPER DEVELOPMENT: Dilute 1 part stock solution with 2 parts water. Develop 1 to 2 minutes at 68 F (20 C). For softer and slower development dilute 1 to 4, and develop 1½ to 3 minutes at 68 F (20 C). For greater brilliance, shorten the exposure slightly and lengthen the developing time. For greater softness, lengthen the exposure slightly and shorten the developing time.

FILM DEVELOPMENT: Dilute 1 part stock solution with 1 part water and develop 3 to 5 minutes at 68 F (20 C). For softer results, dilute 1 to 3 and develop 3 to 5 minutes at 68 F (20 C).

ANSCO 130

UNIVERSAL PAPER DEVELOPER

This formula is a universal developer for all projection and contact papers. It gives rich black tones with excellent brilliance and detail. Ansco 130 provides unusual latitude in development and is clean-working even with long developing times.

Stock Solution

	Metric	Avoirdupois	
Hot Water (125 F or 52 C)	750 cc.	24 ounces	3 quarts
Ansco Metol	2.2 grams	32 grains	¼ oz. 20 gr.
Ansco Sodium Sulfite, anhydrous	50 grams	1½ oz. 75 gr.	6¾ ounces
Ansco Hydroquinone	11 grams	¼ oz. 50 gr.	1¼ oz. 90 gr.
Ansco Sodium Carbonate, monohydrated	78 grams	2½ oz. 50 gr.	10½ ounces
Ansco Potassium Bromide	5.5 grams	80 grains	¾ ounce
Ansco Glycin	11 grams	¼ oz. 50 gr.	1¼ oz. 90 gr.
Water to make	1 liter	32 ounces	1 gallon

The prepared stock solution is clear but slightly colored. The coloration in this case does not indicate the developer has deteriorated or is unfit for use.

For use, dilute 1 part stock solution with 1 part water.

Normal developing time at 68 F (20 C) for Brovira, 2 to 6 minutes, for Convira, Cykon, Cykora and Indiatone, 1½ to 3 minutes.

Greater contrast can be obtained by using the developer stock solution full strength. Softer results can be obtained by diluting 1 part stock solution with 2 parts water.

ANSCO 135

WARM-TONE PAPER DEVELOPER

This developer is recommended for rich, warm-black tones with Cykon, Convira, Cykora, Indiatone and similar papers. This formula may be obtained in packaged form by ordering Ansco 135 Developer.

Stock Solution

	Metric	Avoirdupois	
Hot Water (125 F or 52 C)	750 cc.	24 ounces	3 quarts
Ansco Metol	1.6 grams	24 grains	94 grains
Ansco Sodium Sulfite, anhydrous	24 grams	¾ oz. 20 gr.	3¼ ounces
Ansco Hydroquinone	6.6 grams	96 grains	¾ oz. 60 gr.
Ansco Sodium Carbonate, monohydrated	24 grams	¾ oz. 20 gr.	3¼ ounces
Ansco Potassium Bromide	2.8 grams	40 grains	¼ oz. 50 gr.
Water to make	1 liter	32 ounces	1 gallon

For use, dilute 1 part stock solution with 1 part water. A properly exposed print will be fully developed at 68 F (20 C) in about 1½ to 2 minutes. Complete development may be expected to take slightly longer with rough-surfaced papers than with semi-glossy or luster-surfaced papers. For greater softness, dilute the bath with water up to equal quantities of developer and water. To increase the warmth, add bromide up to double the amount in the formula. The quantity of bromide specified in the formula, however, assures rich, warm, well-balanced tones.

ANSCO 201

ACID HARDENING FIXER

This hardening fixing bath for use with either film or paper may be stored indefinitely and used repeatedly until exhausted. If the fixing bath froths, turns cloudy, or takes longer than 10 minutes to fix out completely, it must be replaced by a fresh solution.

Solution 1

	Metric	Avoirdupois	
Hot Water (125 F or 52 C)	500 cc.	16 ounces	½ gallon
Hypo	240 grams	8 ounces	2 pounds

Solution 2

	Metric	Avoirdupois	
Hot Water (125 F or 52 C)	150 cc.	5 ounces	20 ounces
Ansco Sodium Sulfite, anhydrous	15 grams	½ ounce	2 ounces
Ansco Acetic Acid (28%)	45 cc.	1½ ounces	6 ounces
Ansco Potassium Alum	15 grams	½ ounce	2 ounces
Add Solution 2 to 1 and add water to make	1 liter	32 ounces	1 gallon

Dissolve chemicals thoroughly in order given and stir rapidly while adding Solution 2 to Solution 1. Glacial acetic acid may be diluted to 28% concentration by adding 3 parts of acid to 8 parts of water. Do not dilute for use. Normal fixing time 5 to 10 minutes at 68 F (20 C).

ANSCO 202

CHROME ALUM FIXER

This hardening fixing bath for use with films in hot weather should be used fresh, as it does not retain its hardening action.

Solution 1

	Metric	Avoirdupois
Hot Water (125 F or 52 C)	2.5 liters	80 ounces
Hypo	960 grams	2 pounds
Ansco Sodium Sulfite, anhydrous	60 grams	2 ounces
Water to make	3 liters	3 quarts

Solution 2

	Metric	Avoirdupois
Water	1 liter	32 ounces
Ansco Potassium Chrome Alum	60 grams	2 ounces
Sulphuric Acid C.P.	8 cc.	¼ ounce

Slowly pour Solution 2 into Solution 1 while rapidly stirring the latter. Do not dilute for use. Do not dissolve the chrome alum at a temperature higher than 150 F (66 C). Always rinse films thoroughly before fixing. Normal fixing time 5 to 10 minutes at 68 F (20 C).

ANSCO 203

NON-HARDENING METABISULFITE FIXER

This fixing bath is recommended for use when hardening is not desired. It is highly desirable for accuracy of registration in color work with Reprolith Film.

Stock Solution

	Metric	*Avoirdupois*
Hypo	1900 grams	4 pounds
Potassium Metabisulfite	270 grams	9 ounces
Water to make	4 liters	1 gallon

The metabisulfite should be added only when the hypo solution is cool.

For use, dilute one part stock solution with one part water. Normal fixing time 5 to 10 minutes at 68 F (20 C).

ANSCO 204

ACID HARDENING FIXER

This hardening fixing bath for use with either film or paper may be stored indefinitely and used repeatedly until exhausted.

	Metric	*Avoirdupois*
Hot Water (125 F or 52 C)	750 cc.	24 ounces
Ansco Sodium Thiosulfate	240 grams	8 ounces
Ansco Sodium Sulfite	15 grams	½ ounce
Ansco 28% Acetic Acid	75 cc.	2½ ounces
Borax	14.5 grams	½ ounce
Ansco Potassium Alum	15 grams	½ ounce
Water to make	1000 cc.	32 ounces

Dissolve chemicals thoroughly in order given and stir rapidly. Do not dilute for use. Normal fixing time 5 to 10 minutes at 68 F (20 C). Glacial acetic acid may be diluted to 28% concentration by adding 3 parts of acid to 8 parts of water.

ANSCO 210

ACID SHORT-STOP BATH

This solution is recommended for use between developer and fixer, to prevent staining of film negatives, radiographs, prints, etc. Agitate negatives or prints for at least 5 seconds in this bath before transferring to fixing solution.

	Metric	*Avoirdupois*
Ansco Acetic Acid 28%	45 cc.	1½ ounces
Water	1 liter	32 ounces

Glacial acetic acid (99.5%) may be diluted to the 28% concentration by mixing three parts of glacial acetic acid with eight parts of water.

ANSCO 216

CHROME ALUM HARDENING BATH

This bath may be used in place of the regular acetic acid short-stop to give additional hardening to film. It is particularly desirable in hot weather, for tropical development, and for negatives which have to be enlarged while wet.

	Metric	*Avoirdupois*
Ansco Potassium Chrome Alum	30 grams	1 ounce
Water	1 liter	32 ounces

Films should be agitated thoroughly when immersed in the solution. Maximum hardening will be obtained with about three minutes treatment.

The solution should be used fresh as it does not keep well. Formation of a greenish sludge is an indication that the solution should be replaced by a fresh bath.

If the Chrome Alum used is such that sludge is formed when the bath is first used an addition of concentrated sulfuric acid (2 cc. per liter or ½ dram per 32 ounces) can be made to the solution to overcome this condition.

ANSCO 221

SEPIA TONER

This toner is recommended for warm-brown sepia tones.

Solution 1

	Metric	*Avoirdupois*
Hot Water (125 F or 52 C)	750 cc.	24 ounces
Ansco Dipotassium Mono Sodium Ferricyanide or Potassium Ferricyanide	50 grams	1½ oz. 75 gr.
Ansco Potassium Bromide	10 grams	¼ oz. 35 gr.
Ansco Sodium Carbonate, monohydrated	20 grams	½ oz. 70 gr.
Water to make	1 liter	32 ounces

Solution 2

	Metric	*Avoirdupois*
Ansco Sodium Sulfide	45 grams	1½ ounces
Water to make	500 cc.	16 ounces

For use as described below, dilute one part Solution 2 with eight parts water.

IMPORTANT—Be sure to use sodium sulfide, not sodium sulfite, in compounding the redeveloper. Also use clean trays, free from exposed iron spots, especially with bleaching bath. Otherwise blue spots may form on prints.

Prints should be washed thoroughly and then bleached in Solution 1 until the black image is converted to a very light brown color (about 1 minute). Prints should then be washed for 10 to 15 minutes and redeveloped in diluted Solution 2.

Redevelopment should be complete in about 1 minute. After redevelopment the prints should be washed for about 30 minutes and then dried. If the toner should leave sediment which results in streaks or finger marks on the surface of the paper, the print should be immersed for a few seconds in a 3% solution of acetic acid, after which a 10-minute washing is necessary.

ANSCO 222

HYPO ALUM TONER

This toner is recommended for beautiful reddish-brown tones.

	Metric	*Avoirdupois*
Solution 1		
Water	2350 cc.	80 ounces
Hypo	450 grams	15 ounces
Solution 2		
Water	30 cc.	1 ounce
Ansco Silver Nitrate	1.3 grams	20 grains
Solution 3		
Water	30 cc.	1 ounce
Potassium Iodide	2.7 grams	40 grains

Add Solution 2 to Solution 1. Then add Solution 3 to the mixture. Finally add 105 grams (3½ ounces) of Ansco Potassium Alum to this solution, and heat the entire bath to the boiling point or until sulfurization takes place (indicated by a milky appearance of the solution). Tone prints 20 to 60 minutes in this bath at 110-125 F (43-52 C). Agitate prints occasionally until toning is complete. Care should be taken to see that the blacks are fully converted before removing the prints from the toning bath, unless double tones are desired.

ANSCO 223

NELSON GOLD TONER

E. K. Co. U. S. Pat. Number 1,849,245

With this toner it is possible to obtain a variety of pleasing brown tones by varying the time of toning. Prints may be removed from the bath when the desired color is reached. This formula is suitable for use with Cykora, Indiatone, Cykon, and Convira.

Solution 1

	Metric	*Avoirdupois*
Warm Water, about 125 F (52 C)	4 liters	1 gallon
Ansco Sodium Thiosulfate (Hypo)	960 grams	2 pounds
Ammonium Persulfate	120 grams	4 ounces

Dissolve the hypo completely before adding the persulfate. Stir vigorously while adding the persulfate. If the bath does not turn milky, increase the temperature until it does.

Prepare following solution and add it (including precipitate) slowly to the hypo-persulfate solution while stirring the latter rapidly. *Bath must be cool when these solutions are added together.*

Cold Water	64 cc.	2 ounces
Ansco Silver Nitrate	5.2 grams	75 grains
Sodium Chloride	5.2 grams	75 grains

NOTE: *The Silver Nitrate should be dissolved completely before adding Sodium Chloride.*

Solution 2

Water	250 cc.	8 ounces
Ansco Gold Chloride	1 gram	15 grains

For use, add 4 ounces (125 cc.) of Solution 2 slowly to Solution 1 while stirring the latter rapidly.

The bath should not be used until after it has become cold and has formed a sediment. Then pour off the clear liquid for use.

Pour the clear solution into a tray standing in a water bath and heat to 110 F (43 C). The temperature, when toning, should be between 100 and 110 (38 to 43 C). Dry prints should be soaked thoroughly in water before toning.

Keep at hand an untoned black-and-white print for comparison during toning. Prints should be separated at all times to insure even toning.

When the desired tone is obtained, rinse the prints in cold water.

After all prints have been toned, return them to the fixing bath for five minutes, then wash for one hour in running water.

The bath should be revived at intervals by the addition of further quantities of the gold Solution 2. The quantity to be added will depend upon the number of prints toned and the time of toning. For example, when toning to a warm brown, add 1 dram (4 cc.) of solution after each fifty 8 x 10 prints, or their equivalent, have been toned. Fresh solution may be added from time to time to keep the bath up to the proper volume.

ANSCO 231

GOLD TONER

This formula gives a range of red tones to sepia-toned prints, the brilliance of the tone depending on the paper used. Brilliant chalk-red tones are produced on Cykon, while with Indiatone and Cykora darker shades are formed. If desired, deep blue tones may also be obtained with this formula by using black-and-white prints instead of prints that have first been sepia-toned. Unusual effects of mixed tones of blue-black shadows and soft reddish highlights can be produced by using prints which have been partially toned in a hypo alum sepia toner.

	Metric	*Avoirdupois*
Hot Water (125 F or 52 C)	750 cc.	24 ounces
*Ammonium Sulfocyanate	105 grams	3½ ounces
†Ansco Gold Chloride, 1% Solution	60 cc.	2 fluid oz.
Water to make	1 liter	32 ounces

For Red Tones: Prints must first be bleached and toned by sulfide redevelopment method (see Ansco 221). After washing, place prints in above solution until toning is complete (requires 15-45 minutes). For redder tone one-half the specified amount of sulfocyanate may be used.

For Deep Blue Tones: Omit sepia toning operation and place well-washed black-and-white prints directly in above toning solution.

For Mixed Tones: Prints should be incompletely toned in a hypo alum toner, such as Ansco 222, and washed before treatment in above solution.

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* May be substituted by:

Sodium Sulfocyanate	110 grams	3¾ ounces
or		
Potassium Sulfocyanate	135 grams	4½ ounces

† The contents of a 15-grain bottle of Ansco Gold Chloride dissolved in 3½ ounces of water will give a 1% solution.

ANSCO 241

IRON BLUE TONER

Producing brilliant blue tones, this formula is suitable for use with Cykora, Brovira and Indiatone Papers.

	Metric	*Avoirdupois*
Hot Water (125 F or 52 C)	500 cc.	16 ounces
Ferric Ammonium Citrate	8 grams	¼ ounce
Ansco Potassium Ferricyanide	8 grams	¼ ounce
Ansco Acetic Acid, 28%	265 cc.	9 ounces
Water to make	1 liter	32 ounces

Solution should be prepared with distilled water if possible. If enameled iron trays are used, no chips or cracks in the enamel should be present or spots and streaks may appear in the print.

Prints for blue toning should be fixed in plain, non-hardening hypo bath (which should be kept at a temperature of 68 F or under to avoid undue swelling). When prints have been fully toned in the above solution, they will be greenish in appearance, but will be easily washed out to a clear blue color when placed in running water.

The depth of the blue toning will vary somewhat with the quality of prints toned in it, light-toned prints generally toning to lighter blues. Some intensification of the print usually occurs in toning; consequently, prints should be slightly lighter than the density desired in the final toned print.

Wash water should be acidified slightly with acetic acid since the blue tone is quite soluble in alkaline solutions and is considerably weakened when wash water is alkaline. Pleasing variations in the tone can be obtained by bathing the washed prints in a ½% solution (5 grams per liter) of borax which produces softer, blue-gray tones, the extent depending on the length of treatment.

ANSCO 251

GREEN TONER

This formula produces rich green tones by combining the effects of iron blue toning and sulfide sepia toning. It must, however, be employed carefully and with particular attention both to the directions outlined below, and to cleanliness in handling prints throughout all steps of the process. The formula is not adaptable to all types of paper and surfaces and is suggested for use only with the following Ansco papers: BROVIRA, Velvet and Kashmir White; CYKORA, Kashmir White; INDIATONE, Matte White; CYKON, Kashmir White and Matte White; and PROJECTION PROOF.

Solution 1

	Metric	*Avoirdupois*
Ansco Dipotassium Mono Sodium Ferricyanide or Potassium Ferricyanide	40 grams	1¼ oz. 40 gr.
Water	1 liter	32 ounces
Ammonia .91 S.G. (25% in weight)	15 cc.	3 drams

Solution 2

Ferric Ammonium Citrate	17 grams	½ oz. 30 gr.
Water	1 liter	32 ounces
Hydrochloric Acid Conc.	40 cc.	1¼ ounces

Solution 3

Ansco Sodium Sulfide	2 grams	30 grains
Water	1 liter	32 ounces
Hydrochloric Acid Conc.*	10 cc.	2½ drams

* Do not add hydrochloric acid to Solution 3 until immediately before use.

Black-and-white prints to be toned should be darker and softer than a normal print, using approximately 25% overexposure on the next softer grade of paper. Development of the print should be carried out in a suitable developer (A125 or A135) with particular attention given to avoid underdevelopment or forcing the print with overdevelopment. Prints should be fixed as usual, *thoroughly* washed and completely dried before toning.

Prints to be toned should be first soaked in cold water until limp and then placed in Solution 1 until bleached. This operation should be completed in 60 seconds or less, and the bleached prints immediately transferred to running water where thorough washing (at least 30 minutes) is effected.

Bleached prints are then placed in Solution 2 for 45 seconds to one minute, toning being permitted to continue until the deepest shadows are completely toned. Prints should then be washed briefly (4 to 6 minutes), excessive washing being undesirable in view of the solubility of the blue image. If wash water is slightly alkaline, it should be acidified somewhat with acetic acid to prevent degradation of the blue tone during washing.

The blue-toned prints are next immersed in Solution 3 until the green tone is sufficiently strong, the operation requiring about 30 seconds. Toned prints should then receive a final washing of 20 to 30 minutes in neutral or slightly acidified wash water and dried. Avoid heat and belt drying machines for drying.

All solutions should be prepared within 24 hours before use. Great care should be taken to avoid contamination of Solutions 1 and 2. Even slight traces of Solution 1 carried over on hands or prints into Solution 2 can cause blue stains. Solution 3 should be used in a well-ventilated room, preferably near an open window or exhaust fan to lessen chance of inhaling hydrogen sulfide formed in the solution.

ANSCO 310

FARMER'S REDUCER

This is a cutting reducer for lessening the density of heavy negatives and at the same time increasing their contrast. It is especially valuable for reproduction films to clear the whites.

Solution 1

	Metric	*Avoirdupois*
Hypo	240 grams	8 ounces
Water to make	1 liter	32 ounces

Solution 2

Ansco Dipotassium Mono Sodium Ferricyanide or Potassium Ferricyanide	19 grams	½ oz. 70 gr.
Water to make	250 cc.	8 ounces

For use mix one part Solution 2 and four parts Solution 1 in 32 parts water. Solutions 1 and 2 should be stored separately and mixed immediately before use.

ANSCO 311

FLATTENING REDUCER

This reducer is useful for lessening the density and contrast of heavy negatives.

Solution 1

	Metric	*Avoirdupois*
Ansco Dipotassium Mono Sodium Ferricyanide or Potassium Ferricyanide	35 grams	1 oz. 75 gr.
Ansco Potassium Bromide	10 grams	¼ oz. 35 gr.
Water to make	1 liter	32 ounces

Bleach in Solution 1 and after thorough washing, redevelop to desired density and contrast in Ansco 47 or other negative developer except fine-grain developers. Then fix and wash in usual manner. Conduct operation in subdued light.

ANSCO 330

MERCURY INTENSIFIER

This intensifier is recommended for increasing the printing density of thin, flat negatives.

	Metric	*Avoirdupois*
Ansco Potassium Bromide	10 grams	¼ oz. 35 gr.
*Mercuric Chloride	10 grams	¼ oz. 35 gr.
Water to make	1 liter	32 ounces

Do not dilute for use. Negatives to be intensified must be very thoroughly washed first or yellow stains may result on the intensified negative. Immerse negatives in above solution until thoroughly bleached to the base of the film and then wash in water containing a few drops of hydrocloric acid. Redevelop bleached negatives in 5% sodium sulfite or any standard developer. Surface scum which forms during storage of the bleaching solution does not affect the bleacher but should be removed before using the solution.

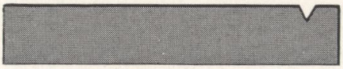
* Poison—Danger.

ANSCO NOTCHING IDENTIFICATION CODE

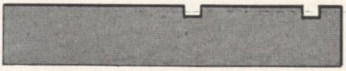
Ansco professional sheet films have the following notches to permit easy identification in the darkroom. The emulsion side of the film is toward you when the notches are in top edge of the upper hight-hand corner (or in the bottom edge of the lower left-hand corner).

This notching system applies to 3¼ x 4¼ and larger sizes of Ansco films. All sizes of Ansco sheet films smaller than 3¼ x 4¼ are marked with a single, shallow notch in the usual position. This small notch is used only for identification of the emulsion side and is *not* for indication of the emulsion type.

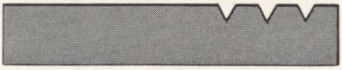
ANSCO FILM NOTCHING CODE



SUPERSENSITIVE PLENACHROME



SUPERPAN PRESS



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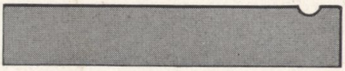

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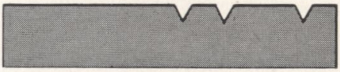

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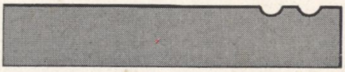

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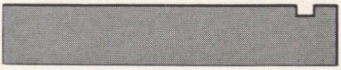
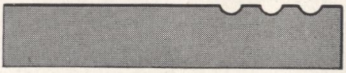


SUPERPAN PORTRAIT



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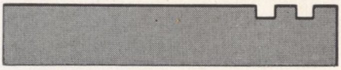

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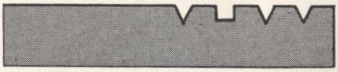
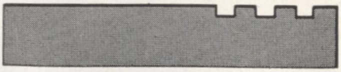
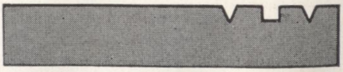


ANSCO COLOR DAYLIGHT



ISOPAN



ANSCO COLOR TUNGSTEN

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47A Replenisher	1 gallon and 5 gallon sizes
103 Paper Developer	1 quart, ½ gallon, 1 gallon and 5 gallon sizes
125 Paper and Film Developer	1 quart, ½ gallon, 1 gallon and 5 gallon sizes
135 Paper Developer	1 quart, ½ gallon, and 1 gallon sizes
M-Q Universal Paper and Film Developer	5 tube cartons and 100 tube boxes
Fine-Grain Tube Film Developer	5 tube cartons
Acid Hypo	1 quart, ½ gallon, and 1 gallon sizes
Direct Sepia Toner	4 ounce, 16 ounce and 1 gallon sizes
Liquid Flemish Toner	8 ounce, 32 ounce and 1 gallon sizes
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